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ABSTRACT

This is a report on the third phase of Project IN-STEP, which was intended to develop a viable model for individualized, multi-media in-service teacher education programs. (Phase I and II are reported in ED 033 905, and ED 042 709). The rationale for Phase III was to see if the model could be successfully transferred to an area other than teaching teachers to teach elementary science, and so permit acceptance of the hypothesis that the IN-STEP approach was successful. A vehicle for field testing the model was developed during Phase III, through a course in Management of Instructional Systems, and the model was then implemented to teach this course. Approximately 85 teachers in Palm Beach County took part in this field test. Instruction was individulized to a much greater extent by pre-assessing participants. Results showed that approximately 93 percent of the participants in Phase III developed an instructional system of their own, 100 percent completed at least one of the modules with a mastery of its content, and approximately 98 percent indicated that they had changed their behavior in the classroom and that they would implement skills, materials, and new techniques which they had acquired. The course is regarded as a vital step in teaching teachers to humanize their curricula offerings while still maintaining some structure within their program. (MBM)

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EVALUATION REPORT

PHASE III

Individualized Inservice Teacher Education

(PROJECT IN-STEP)

An ESEA Title III Project (P.L. 89-10)
SDE No. 2320-50-69001

School Board of Palm Beach County

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John C. Thurber

December, 1971

FOREWORD

Project IN-STEP has made a significant contribution to inservice education. It has served to bridge the gap between theory and practice in the inservice training of classroom teachers. The concept of "Modular Mastery" is one that is only beginning to make its way felt in the universities and other institutions affording public school teachers inservice education. The development and implementation of modular packets in the instructional program will no doubt have two overriding benefits for the youth served by Project IN-STEP.

(1) Teachers who receive "Paced Learning Packets" including the best techniques available in teacher-learner dynamics are apt to internalize parts of the module process of instruction.

(2) When the process is internalized and put into effectual practice in the classroom, accountability, that much sought after yet often minimally achieved goal, is more likely to be realized.

Appropriately, one of the first modules of instruction was on needs assessment. The illustration used by personnel at Project IN-STEP gives the classroom teacher that extra bit of awareness needed to help her begin to focus on the essence of accountability. To recapitulate the point, the educational need of a learner is as precious as a diamond. If we subtract a circle (○) from a square (□) we can, with care and refinement, get a diamond (◇).

What should be, minus what is, equals an educational need. This concept presupposes that a classroom teacher has the professional training and attitude necessary to know what should be. In mandates that diagnostic and prescriptive action be taken by the teacher. Only then will "educational needs" have more than a tin ringing of jargoneze. Individual needs will become as precious as diamonds because someone took the time to care.

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INTRODUCTION

We are living in a truly remarkable time. Although this statement may sound cliche, it is fact. Not only is our knowledge of the universe expanding at a fantastic rate, but the rate at which new educational concepts and programs are being produced is something of a phenomenon in itself.

Most of the concepts and programs now being developed and implemented require a new orientation on the part of all educators who would implement them. Viewed in this light, educational processes--if they are to be successful--can no longer be an undertaking merely in the sense of developing a mind filled with an encyclopedic collection of facts, methods and techniques. To comprehend all factual knowledge, even in a specialized area, has become a physical impossibility. Besides the speed and efficiency of electronic information retrieval makes this type of learning outdated. Furthermore, and perhaps even more important, the teacher of the seventies is going to have to be one who genuinely cares about his students. Frost and Rowland, among others, have stated that the teacher of the seventies and beyond, if he wants to succeed, will necessarily have to come to terms with the essential humanity of students. He will have to realize that neglect of needs, fears and joys of the learning experience produce a masking over of his own humanity. In general, what is desired is a rebirth of these aspects which too frequently have been conditioned into unawareness.[1]

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[1] Frost, Joe L. and Rowland, G. Thomas, Curricula For The Seventies, Early Childhood Through Early Adolescence, Houghton Mifflin Co., Boston, 1969, p. 433.

Needed are types of learning programs which give one the mental tools, skills and processes necessary for dealing with his intellectual as well as his physical existence in the environment of today and for the future. This is true for all types of educational endeavor, including teacher education.

Reich has suggested that today's consciousness seeks a new knowledge of what it means to be human, in order that the machine, having been built, may now be turned towards human ends; in order that man once more can become a creative force, renewing and creating his own life and thus giving life back to his society.[2]

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[2] Reich, Charles A., The Greening of America, Bantam Books, Inc., New York, 1971, p. 4.

With the arising of the new curricula concepts and the new consciousness, the challenge of instructional improvement has become an exceedingly complex and many faceted problem for local school boards as well as a matter for national concern. The total picture school boards face in this area involves not only reordering priorities and philosophies, but also efficient utilization of both financial and human resources in the training and retraining of teachers.

With the above stated needs providing the motivational impetus, a proposal for individualizing the inservice training of teachers was written, funded, implemented and modified. The program became known as Project IN-STEP (an acronym for inservice teacher education program). The primary funding was approximately $400,000 for a three year period under ESEA Title III of Public Law 89-10; however, additional types of funding made possible implementation of the program in other counties, states, countries, and institutions besides Palm Beach County, Florida, where the project was centered. Total funds for all systems implementing probably approximated one-half million dollars.

PHASES I & II

The goal of Project IN-STEP was to develop a model for individualized inservice education of teachers. The technique employed was an individualized multi-media approach. In employing this method a way for implementing modern curriculum developments with large numbers of teachers is also acquired. The development, implementation, evaluation and modification took place over a three year period of time as follows:

Phase I - July 1, 1968 - June 30, 1969; Phase II - July 1, 1969 - June 30, 1970; Phase III - July 1, 1970 - June 30, 1971.

The subject vehicle chosen for developing and testing the model for the first two years (Phase I & II) was the contemporary elementary science education program, "Science - A Process Approach (AAAS Science)."

Phase I of the project was conducted to develop and evaluate a new inservice education model. An elementary science curriculum, "Science--A Process Approach" (AAAS Science), provided content for the training program which makes use of video tapes, self-study programed text materials, and classes in which teachers use the AAAS classroom materials. In the fall 1968, teachers were placed in four instructional groups on the basis of pretest assessments, with those in one group serving as a control group. At the end of the academic year 1968-69, attitude and achievement tests were administered to the approximately 300 elementary teachers and a random selection of their students (matched) of teachers from outside the program. Analysis of the posttest data permits acceptance of the hypothesis that the IN-STEP approach is an effective and efficient method of conducting inservice training (at least in AAAS Science). Conclusions were based on gain in group mean scores due to the instructional program; generally favorable attitudes; cost effectiveness comparison between IN-STEP approach and a traditional approach; indirect measure of proficiency of IN-STEP students; and moderately favorable indications of a difference in the attitudes toward science of IN-STEP and non-IN-STEP children.[3]

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[3] Thurber, John C., "Individualized In-Service Teacher Education, Project IN-STEP, Evaluation Report Phase I", Research In Education, Educational Resources Information Center (ERIC) Clearinghouse, Washington, March, 1970.

Phase II of Project IN-STEP was conducted to revise, refine, and conduct further field testing of a new inservice teacher education model. Revision activities, based on feedback provided for Phase I, include the remaking of six videotape lessons, development of an "Action Handbook" to supplement them, and revision of the 200-page self-study programed text. An elementary science curriculum, "Science--A Process Approach" (AAAS Science), provided the content for the development of the model. During the 1969-70 school year, 511 elementary school teachers in Palm Beach County and Alachua County, Florida, were admitted to IN-STEP training programs in AAAS Science. Both experimental and control groups were pre and posttested with the Elementary Science Teachers Inventory (Lane). Analysis of data serves to further confirm the hypothesis suggested by Phase I: that the IN-STEP approach is an effective and efficient method of conducting inservice training. Conclusions were based on statistically significant gains in group mean scores of all the experimental instructional groups during Phase II (1969-70).[4]

PHASE III RATIONALE

The success of Project IN-STEP in developing a program for training teachers in elementary science, however, focused awareness on another problem of in-service education with particular relevance for the elementary or the secondary teacher of more than one subject. Since the average elementary teacher and many secondary teachers are responsible for two or more subjects, even such projects as the IN-STEP, AAAS Science Program, cannot hope to reach teachers in all subject areas for which they are responsible. This is due to limiting factors such as available time, human resources and funds. A training program was needed which would

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[4] Thurber, John C., "Evaluation Report Phase II, Individualized In-Service Teacher Education (Project IN-STEP)," Research In Education, Educational Resources Information Center (ERIC), Clearinghouse on Teacher Education, Washington, D.C., January, 1971.

effect a desirable change in a teacher's mental actions and teaching habits, and allow transference of a workable model from one subject area to another. Perhaps the best way to do this is to effect a change in the area in which the teacher is most familiar, then effect a transfer to other areas.

Rationale for this attempt is shown in the research of Piaget; when a child/person finds himself in a new situation, he thinks about it in terms of the system of mental actions that he brings to that situation....a structure (understanding, principle) then serves to organize new knowledge; conversely, the new situation may modify the structure. Both are facilitated by extensive "application" of new knowledge.[5]

Research and current social pressure show these changes in teacher outlook, however, should not be confined merely to effecting outcomes for their students in the cognitive domain (intellectual skills) but should also seek to show measurable achievements in the affective domain (values, attitudes) of the involved pupils.

The need for the involvement of the affective domain in contemporary educational programs is shown to be desirable by various prominent educators. The educational system cannot claim to be successful until affective goals have taken their rightful place in the classroom, as well as in the courses of study that provide the basis for instruction.[6]

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[5] Phillips, John L., Jr., The Origins of Intellect: Piaget's Theory. Freeman & Company, San Francisco, 1969, p. 109.

[6] Eiss, Albert F., Harbeck, Mary B., Behavioral Objectives In The Affective Domain. National Science Supervisors Association, Washington, D.C., 1968, pp. 9-11.

Additional impetus towards looking for change in other than the confines of the cognitive area is provided by Leonard when he states, "viewing learning as anything that changes the learner's behavior, the educator will expand his domain a thousand fold, for he will realize there are hardly any aspects of human life that cannot be changed, educated. He will see clearly that, if educational enterprise limits itself to what is now ordinarily taught in classrooms, it will be pursuing failure in the coming age."[7]

Further rationale for working in all areas of educational objectives is given by Popham: "there has been growing acceptance of the view that in order to adequately determine the learner's educational needs, we must be attentive to a wide variety of educational outcomes, rather than only the customarily sought types of intellectual achievements."[8]

Project IN-STEP, as originally written, indicated that a curriculum area other than elementary science be used as a vehicle for further developing the model for in-service instruction. In the light of the previously stated findings, it was felt the best possible area to apply the IN-STEP model for in-service instruction is in the field of teaching strategies. Furthermore, it was felt that the program of teaching strategies should reflect contemporary trends in education and society.

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7 Leonard, George B., Education and Ecstasy. Delacorte Press, New York, 1968, p. 19.

8 Popham, W. James, "Educational Needs Assessment in the Cognitive, Affective and Psychomotor Domains". Presentation to ESEA Title III Regional Workshop, Ft. Lauderdale, Florida, 1969.

The central and unifying theme of the program was the attempt to humanize the educational process working within the constraints of a systems approach.

PHASE III - GOAL AND OBJECTIVES

Based upon the needs shown in the introduction and rationale, the primary goal for Phase III of Project IN-STEP was to: Provide teachers and other educators with an educationally sound way for developing a humanized instructional system. It is hoped this will also entail a constructive (favorable) attitude development towards employment of a humanized instructional system approach.

This particular approach to teaching strategies development takes into account that a well designed instructional program must begin with an assessment of the needs and nature of the learner, and that the more varied the priorities (needs) the greater the need for individualization. Only after this is done should the teacher develop and content and learning strategy for the course. The instructional processes are then organized and ordered, facilities and equipment obtained, and the learning process initiated.

Realizing that the most effective way for getting the participating teachers to change their behavior was to treat them as we would have them treat their students, the program was designed accordingly. In other words, an attempt was made to individualize their instruction along the lines of the model we wished them to implement in the classroom.

Individualized instruction has long been a goal of American education. Ideally, individualized instruction means an arrangement that makes it possible at all times for each student participant engaged in

learning those things which are most appropriate for himself as an individual.[9] This ideal can never be reached, of course. The best we can do is move towards it along a planned continuum. The project provided a model for moving in this direction. Mager states that individualized instruction is not a matter of black vs. white, but rather a matter of degree and nature. To this end the project used questions suggested by Mager as a guide in striving towards as great a degree of individualization as possible.[10]

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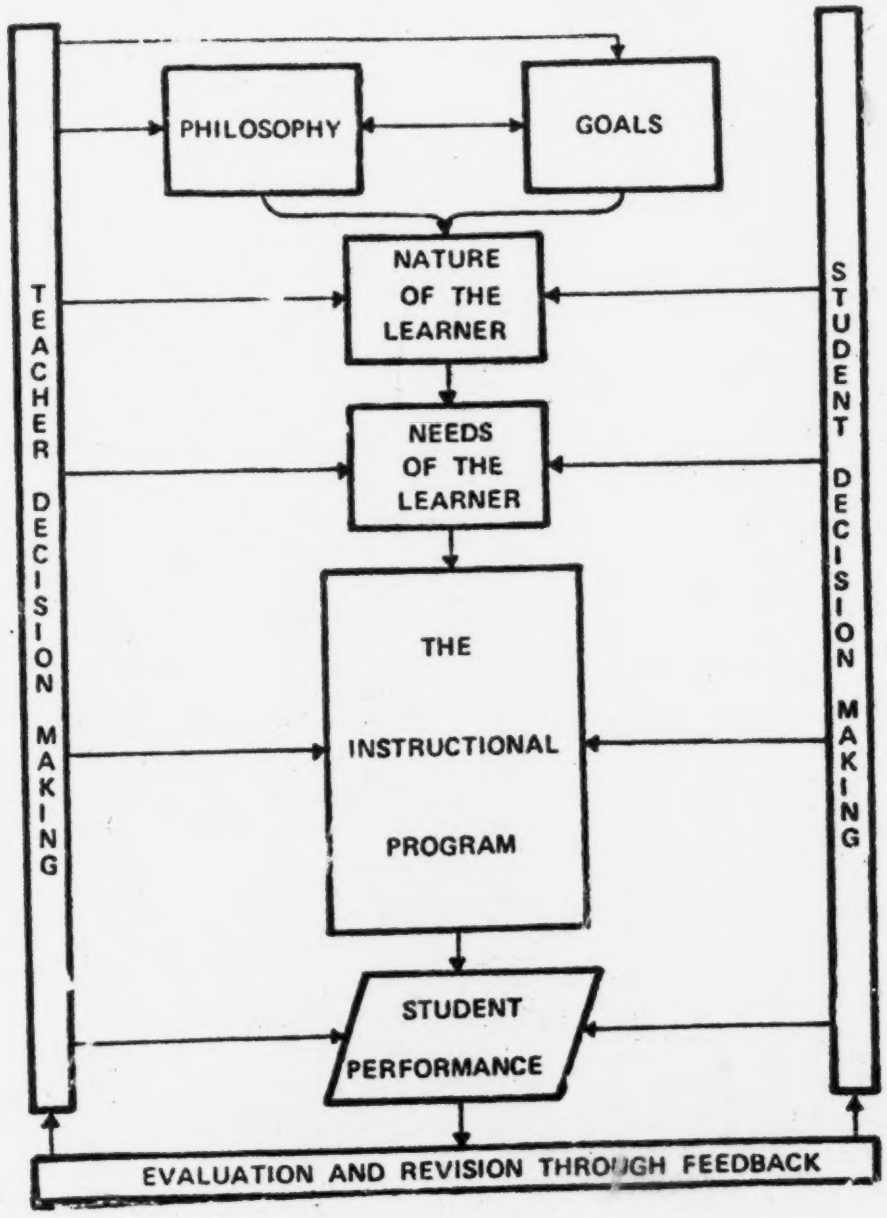
9 Esbensen, Thorwald, Working With Individualized Instruction: The Duluth Experience. Fearon Publishers, Palo Alto, 1968, p. 1.

10 Mager, Robert F., Foreword to: Working With Individualized Instruction: The Duluth Experience. Fearon Publishers, Palo Alto, 1968, p. VII.

The operational objective was basically the same as the goal only couched in behavioral terms. At the end of participation in Phase III activities, a participant was to construct an actual instructional system of his own leading to a desired terminal behavior. This was to be based upon the model developed by the IN-STEP staff, (Fig. 1), or some other model which met the criteria used in checking the thoroughness of the model.



MODEL FOR AN INSTRUCTIONAL SYSTEM

The criteria used in checking the instructional systems was as follows:

1. Statement of a philosophy consistent with a dynamic education program
2. Arrangement for assessing the needs of the learner
3. Proper development of content and learning strategy shown by:
   a) Use of operational objectives
   b) Use of a behavioral hierarchy
   c) Use of individualized instruction techniques
   d) Proper use of facilities and equipment
4. Provision for constant monitoring (evaluation) and use of feedback from this process
5. Ability to express this system in a flowchart model similar to that shown in Figure 1, giving examples for area shown.

PHASE III OPERATIONAL PROCEDURE

Each teacher in Palm Beach County was informed of the program and invited to take part in it. Registration was limited to 100 participants on a first-come-first-served basis. Eighty-five persons elected to participate.

Participants were offered graduate level college credit or they could qualify for points towards certificate renewal under the Palm Beach County Master Plan for in-service education. To offset tuition expenses, the participants received a stipend.

After registration all the participants took part in a 3-hour instructional module which covered the introduction and mechanics of the program. A portion of this module included viewing a 25-minute live telelesson overview of Phase III.

The remainder of the program consisted of the following series of learning modules:

1. Introduction
2. Psychological Foundations
3. Introduction to Systems Approach and Flowcharting
4. Use of Behavioral Objectives
5. Educational Taxonomies
6. Educational Needs Assessment
7. Behavioral Hierarchies
8. Review
9. Instructional Techniques
10. Evaluation of an Instructional System

Following the introductory module, the participants took the first option test. Successful completion allowed one to omit that particular module and move to the next. For those who did not do well on the option test, the next step was to work in a self-study programmed text for that particular module. These text booklets were written by the IN-STEP staff with the exception of the modules on Behavioral Objectives. After completing the self-study booklet, another performance test was taken. If that test showed mastery, then the participant passed to the next module; however, if additional work was indicated the participant was then involved in a 2-3 hour telelesson workshop. At this workshop video tapes were viewed and participants interacted with the telelesson via the Action Handbook. This handbook contains information and tasks relating to the first ten telelessons. These telelessons present the more "theoretical" aspects of Project IN-STEP and each of them corresponds with one of the segments in the first section of the Handbook. The organiza-

tion of each of these segments is as follows:

I. Rationale For The Telelesson/Workshop

II. Objectives Of The Telelesson/Workshop

III. Operational Definitions

IV. Pre-Telelesson Task

V. Telelesson/Workshop Task

VI. Post-Telelesson Task (Optional)

VII. Summary Of The Telelesson/Workshop

This format is based upon the realization that although teachers need a better theoretical understanding of both curriculum content ana teaching strategies, if what knowledge and skills they gain are to effect a change in their behavior (learning), they need frequent opportunities to apply their knowledge and skills in action-oriented situations. Thus, rotation between theory and practice is provided in amounts small enough to be managed by the teacher-participant. This has proven to be very beneficial to the participating teachers. It has been mentioned that, if what teachers learn is to lead to change in teacher-student behavior, then they need frequent opportunities to apply new knowledge and skills in learning situations. Thus, rotation between theory and practice should be sequenced amounts, small enough to be manageable for the teacher.[11]

The telelessons were written and produced by the IN-STEP staff with the assistance of the Palm Beach County Instructional Television

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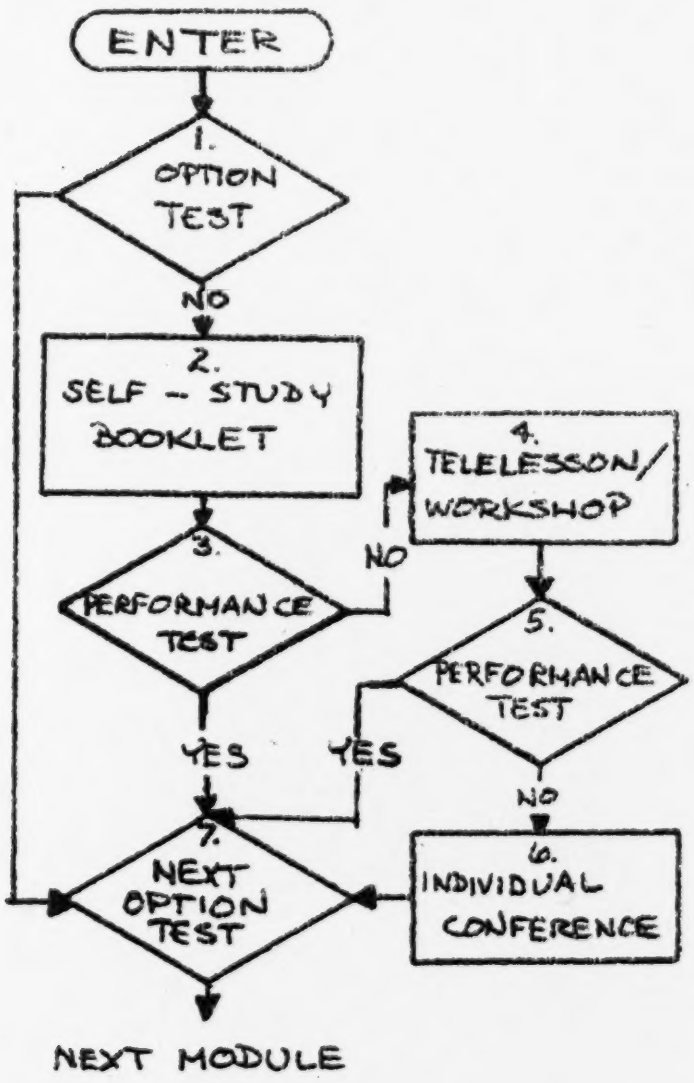
[11] "Teaching Strategies For Developing Children's Thinking". Institute For Staff Development, Menlo Park, California, 1968, Section I, p. 2.

Network. In addition to regularly scheduled viewing times for the workshop, they could be called upon on a random access basis for viewing at the participant's pleasure. All of the taped lessons are approximately 25 minutes in length and their content reflects the title of each of the modules.

Following a telelesson workshop, the participant took another form of the performance test for that module. Successful performance enabled the participant to pass to the next module. If for some reason the performance did not meet the desired level, then the participant was given an individual conference before being retested again. Passage of the participants through the modules, (Fig. 2), was made with a minimum of logistic problems and was in reality fairly easy to administer.



1. Option test on module
2. Self-Study programmed mat'ls
3. Performance test on self-study booklet
4. Telelesson workshop
5. Performance test on workshop activities
6. Individual conference
7. Option test for next module

Fig. 2
Flow Through A Typical Learning Module

PHASE III EVALUATION PROCEDURES

In keeping with the nature and emphasis of the Phase III program, as proposed, the major evaluation of the program was the construction of an instructional system by each of the participants who completed the entire instructional sequence. The system constructed by the participants was designed on paper before implementation, and the criteria stated under operational objectives were used to check for successful completion.

It was expected that 80 percent of the individuals who complete the instructional program sequence would be able to show this mastery. The 80 percent figure was selected arbitrarily by the project staff. It was realized that for various reasons not all educator participants would complete the entire instructional sequence. However, it was anticipated at least 80 percent of all those entering the program would successfully complete at least one of the instructional modules of the program. Successful completion was shown by an acceptable score on the performance test following the module. The performance tests were of a criterion check nature.

A second type of evaluation was gained from a teacher questionnaire developed by Dr. Rodney Lane, Dean of Continuing Education, Florida Atlantic University in Boca Raton, Florida. This questionnaire was administered to participants several months after completion of Phase III. Although most of the questions reflected teacher attitude of opinion, at least two (no. 16 and no. 17) dealt with utilization of skills gained or a change in the participant's teaching methods (Table I). (See page 19)

TABLE I

TEACHER QUESTIONNAIRE RESULTS

QUESTION	FREQUENCY OF RESPONSES				
1. Purpose and goals were outlined:	A	B	C	D	E
	Inadequately				Thoroughly
	0	1	6	16	25
2. Purposes and goals were:	A	B	C	D	E
	Not realized				Realized
	1	3	9	19	16
3. The organization of material showed:	A	B	C	D	E
	Little Preparation			Careful Preparation	
	0	0	6	25	16
4. Activities were:	A	B	C	D	E
	Meaningless				Very useful
	1	2	17	15	13
5. Instructors presentations produced:	A	B	C	D	E
	Boredom				High interest
	2	3	12	15	14
6. Assignments were:	A	B	C	D	E
	Vague				Clear
	1	3	11	19	13
7. Content and concepts were:	A	B	C	D	E
	Irrelevant-Meager			Relevant-Useful	
	2	1	13	28	3
8. Basis of evaluation was:	A	B	C	D	E
	Teacher centered			Performance centered	
	0	0	7	19	20
9. Instructional techniques and methods:	A	B	C	D	E
	Poor				Outstanding
	0	1	19	23	5
10. Most of the other participants were:	A	B	C	D	E
	Stupid				Brilliant
	0	0	32	13	1
11. Encouragement of thinking was:	A	B	C	D	E
	Non-existent				Outstanding
	0	1	13	28	6
12. Basically, the teaching role of the instructor was:	A	B	C	D	E
	Trivial				Important
	0	4	16	20	7

13. The actual level of the activity was:

A	B	C	D	E
Very low				Very advanced
0	3	21	20	3

14. Use of resource materials was:

A	B	C	D	E
Optional				Essential
1	6	17	14	7

15. I learned

A	B	C	D	E
Nothing			A great deal-much	
1	5	12	20	10

16. I plan to utilize the following amount of new material or skills as a result of this activity:

A	B	C	D	E
None				Great amount
2	4	19	15	6

17. I plan to change my teaching behavior as a result of this activity:

A	B	C	D	E
None				A great deal
2	3	21	19	3

In addition, four questions were asked by an outside source, Interactive Education, Inc., in a survey they made of Phase III participants (Table II).

TABLE II

INTERACTIVE EDUCATION, INC. SURVEY

1. Why did you participate in last year's IN-STEP course in Instructional Systems? Check one of the following:

   ____ Interested in course content to improve teaching.

   ____ Needed inservice master points to extend certification.

   ____ Wanted to earn five quarter hours of graduate credit from Florida Atlantic University.

   ____ Interested in receiving stipend of between $45 and $90.

   ____ Told to enroll in course by principal or supervisor.

2. Would you recommend the IN-STEP course in Instructional Systems to other teachers?

   ____ Yes ____ No

3. How would you rate the following techniques used in the IN-STEP course in Instructional Systems in terms of their instructional value to you? Circle the number that best describes your rating.

ITEM	FREQUENCY OF RESPONSE				
Component	Very High	High	Moderate	Low	Very Low
Programmed Materials	5	4	3	2	1
Supplemental Materials	5	4	3	2	1
Telelessons	5	4	3	2	1
ACTION HANDBOOK	5	4	3	2	1
Workshop Activities	5	4	3	2	1
Workshop Instructor	5	4	3	2	1

4. How would you rate the following learning modules in the IN-STEP course in Instructional Systems in terms of their value to you as you plan and carry out your instructional programs? Circle the number that best describes your rating.

ITEM	FREQUENCY OF RESPONSE				
Psychological Foundations	5	4	3	2	1
Systems Approach	5	4	3	2	1
Behavioral Objectives	5	4	3	2	1

ITEM	FREQUENCY OF RESPONSE				
Module	Very High	High	Moderate	Low	Very Low
Educational Taxonomies	5	4	3	2	1
Educational Needs Assessment	5	4	3	2	1
Behavioral Hierarchies	5	4	3	2	1
Instructional Program	5	4	3	2	1
Evaluation of Instructional Systems	5	4	3	2	1

ANALYSIS AND DISCUSSION OF RESULTS

Concerning the major item of evaluation--that 80% of the participants completing the program and developing an instructional system--we found that the criterion chosen for success was far surpassed. In actuality, of the 85 persons who entered the program, 77 or 93.2% finished and produced an instructional program.

A second criterion to be utilized in judging the effectiveness of the program was that at least 80% of the participants would complete and show mastery of at least one of the instructional modules. Again this criteria was far surpassed as 100% of all 85 original enrollees completed at least the first module with mastery of the content.

Judging from a statistical treatment of the Lane Questionnaire results, (Table III), there was a very favorable attitude towards the Phase III program. The participants felt that purposes and goals of the program were well stated and that they were realized by the end of their participation (Nos. 1 and 2).

Concerning the organization, program activities (Nos. 4,5,& 6), the teachers felt they were useful, the presentations held a great deal of interest, and that the assignments were fairly clear (no. 6). The response on item 6 was important because the teachers were, in essence, treated as the IN-STEP staff would like to have them treat their own classroom. For a great many of these teachers the program was a first attempt at individualization, and of course one of the key concepts involved is that their role in the program seems clear. Hopefully they will be able to transfer this skill and feeling in the presentation of their own instructional systems. Participating teachers felt the program's content and concepts were fairly relevant and useful in their own situations (No. 7). Participants felt quite strongly that their evaluation was based upon their performance (No. 8). This was very much in keeping with the philosophy of Phase III. In item nine the teachers showed a demonstrably positive feeling towards the individualized multimedia approach to inservice training. The participants also felt (No. 10) that their classmates were of average or above intelligence and that they were encouraged to think constructively (No. 11) during the program. Teachers felt (No. 12) the role of the instructor was necessary and that the level of activities required was somewhat advanced (no. 13). They also perceived that the use of resource materials (no. 14) was necessary. Only one participant felt he learned nothing from the course (no. 15) and

most felt they aquired more than an average amount of knowledge and skill from the course. From item 16 we can extrapolate that an overwhelming percentage of the teachers are implementing newly acquired skills and techniques. On the basis of item 17 we can also state that almost all participating teachers changed their classroom behavior as a result of IN-STEP/Phase III, most of them to quite an extent.

TABLE III

STATISTICAL ANALYSIS OF TEACHER QUESTIONNAIRE (LANE) RESULTS

ITEMS	σ	M	N	x	f_e (expected)	f_o (observed) 1	2	3	4	5	t
1	.77	4.33	48	47.62	9.6	0	1	6	16	25	11.98
2	.98	3.96	48	25.75	9.6	1	3	9	19	16	6.81
3	.65	4.21	47	31.75	9.4	0	0	6	25	16	12.87
4	.96	3.77	48	23.67	9.6	1	2	17	15	13	5.58
5	1.08	3.78	46	16.82	9.2	2	3	12	15	14	4.91
6	.97	3.85	47	23.32	9.4	1	3	11	19	13	6.03
7	.97	3.79	47	26.93	9.4	2	1	13	20	11	5.60
8	.71	4.28	46	23.64	9.2	0	0	7	19	20	12.31
9	.69	3.67	48	37.82	9.6	0	1	19	23	5	6.77
10	.51	3.33	46	65.38	9.2	0	0	32	13	1	4.40
11	.67	3.81	48	45.52	9.6	0	1	13	28	6	8.44
12	.84	3.64	47	20.30	9.4	0	4	16	20	7	5.25
13	.71	3.49	47	34.98	9.4	0	3	21	20	3	4.76
14	.98	3.44	45	18.44	9.0	1	6	17	14	7	3.01
15	.98	3.69	48	21.79	9.6	1	5	12	20	10	4.89
16	.99	3.42	48	22.87	9.6	2	4	19	15	6	2.96
17	.86	3.57	48	37.83	9.6	2	3	21	19	3	2.98

Assuming that the population mean would equal 3 in all cases, the x test indicates responses are significant at the $p < .001$ level except nos. 5 and 14 and that these are significant at the .01 level. When a t test is employed, we find that all are significant at or above $p < .005$.

TABLE IV

INTERACTIVE EDUCATION, INC.

SURVEY RESULTS

1. Why did you participate in last year's IN-STEP course in Instructional Systems? Check one of the following:

% of Respondents	Item
60%	Interested in course content to improve teaching.
24%	Needed inservice master points to extend certification.
16%	Wanted to earn five quarter hours of graduate credit from Florida Atlantic University.
0%	Interested in receiving stipend of between $45 and $90.
0%	Told to enroll in course by principal or supervisor.

2. Would you recommend the IN-STEP course in Instructional Systems to other teachers?

79% of respondents YES 13% of respondents NO 8% of respondents No response

3. How would you rate the following techniques used in the IN-STEP course in Instructional Systems in terms of their instructional value to you?

Type of Instructional Material	Item Response (Number indicates times item checked)					
	Very High	High	Moderate	Low	Very Low	Total
Programmed Materials	5	22	7	3	0	37
Supplemental Materials	6	15	11	3	1	36
Telelessons	4	8	12	11	2	37
Action Handbook	8	11	12	4	1	36
Workshop Activities	8	12	13	4	0	37
Workshop Instructor	14	16	6	1	0	37

4. How would you rate the following learning modules in the IN-STEP course in Instructional Systems in terms of their value to you as you plan and carry out your instructional programs?

Name of Learning Module	Item Responses (Number indicates times item checked)					
	Very High	High	Moderate	Low	Very Low	Total
Psychological Foundations	2	17	10	6	0	35
Systems Approach	7	10	16	3	0	36
Behavioral Objectives	7	20	3	6	0	36
Educational Taxonomies	6	12	12	5	0	35
Educational Needs Assessment	8	20	7	2	0	37
Behavioral Hierarchies	5	20	6	5	0	36
Instructional Program	8	15	10	3	0	36
Evaluation of Instructional Systems	7	14	10	5	0	36

TABLE V

STATISTICAL ANALYSIS ITEMS #3 AND #4

INTERACTIVE EDUCATION, INC. SURVEY

3. How would you rate the following techniques used in the IN-STEP course in Instructional Systems in terms of their instructional value to you?

Type of Instructional Material	Analysis of Responses				Rank by mean	Rank by t
	M	σ	t	N		
Programmed Materials	3.78	0.78	6.084**	37	2	2
Supplemental Materials	3.61	0.95	3.853**	36	4	4
Telelessons	3.03	1.08	0.169	37	6	6
Action Handbook	3.58	1.04	3.347*	36	5	5
Workshop Activities	3.65	0.94	4.207**	37	3	3
Workshop Instructor	4.16	0.79	8.937**	37	1	1

4. How would you rate the following learning modules in the IN-STEP course in Instructional Systems in terms of their value to you as you plan and carry out your instructional programs?

Name of Learning Module	Analysis of Responses				Rank by mean	Rank by t
	M	σ	t	N		
Psychological Foundations	3.43	0.84	3.030*	35	8	8
Systems Approach	3.58	0.89	3.911**	36	6	6
Behavioral Objectives	3.78	0.95	4.927**	36	3	3
Educational Taxonomies	3.54	0.94	3.401**	35	7	7
Educational Needs Assessment	3.92	0.78	7.176**	37	1	1
Behavioral Hierarchies	3.69	0.88	4.707**	36	4	4
Instructional Program	3.78	0.89	5.260**	36	2	2
Evaluation of Instructional Systems	3.62	0.94	3.959**	36	5	5

* Significant beyond .005
P < .005

** Significant beyond .001
P < .001

The Interactive Education, Inc. Survey was conducted by a local educational consulting and service agency of the same name. Interactive Education, Inc. has developed as one of its programs a system for enabling all those concerned with educational endeavors to learn how to use a systems approach. They administered a questionnaire (Table IV) to the individuals who participated in IN-STEP/Phase III in an attempt to determine how to format their instructional program. Since the data gathered was germane to an evaluation of the IN-STEP/Phase III Program, they furnished the results of their survey at no charge.

Question one provides interesting background as to why teachers involve themselves in inservice training and staff development programs. Sixty per cent of the participants indicated they took part in the program primarily in order to improve their teaching skills, while forty per cent indicated their priority reason for taking part in the program was a desire to obtain credit; either through the Palm Beach County Master Plan for Inservice Education or Florida Atlantic University towards renewal of their teaching certificate. An interesting extrapolation which suggests itself is that teachers are somewhat more interested in improving their teaching than in receiving credit for doing the same.

Question two indicates that an overwhelming number of participants viewed the program as having sufficient worth to recommend it to their colleagues if it were offered again. This would tend to indicate a favorable response not only to the method of instruction (individualized, multi-media) but also to the content of Phase III (Instructional Systems).

The purpose of question three was an attempt to determine a ranking of the instructional techniques utilized in Phase III according to the participant's feeling towards the instructional value. The ranking ob-

tained by both mean and application of a t test was as follows:

1. Workshop Instructor
2. Programmed Materials
3. Workshop Activities
4. Supplemental Materials
5. Action Handbook
6. Telelessons

The ranking of the workshop instructor as #1 is not surprising in the light of findings and reporting by Rubin, "When a teacher is trying to master a new technique, sustaining persistence is crucial; to do this we relied heavily on the facilitator. Next to self-criticism, criticism by a trusted peer seems to be most easily tolerated by teachers. The importance of a feed-back mechanism, demonstrated in a number of other studies, was confirmed by our findings. We also found that in the case of many pedagogical skills, the need for a human coach who both observes and interprets is unavoidable."[12]

It should be remembered in considering items 3 and 4 of the Interactive Survey that we are dealing with subjective feelings of the participants and that just because a technique is ranked low that it was not effective. For instance, the techniques of utilizing the Action Handbook and Telelessons were used in "remedial loops." They were ranked low as to their felt value; however, when one considers that 100 per cent of the participants mastered at least one module, and 93.2 per cent mastered the entire sequence and produced an instructional system, then

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[12] Rubin, Louis J., A Study On The Continuing Education Of Teachers, Center for Coordinated Education, Santa Barbara.

one must admit that they fulfilled their objective within the frame-work of the program.

Item #4 on the Interactive Survey was to determine a feeling on the part of the participants according to the value of the content of each of the individual instructional modules in planning and carrying out their own instructional program. In other words, which kinds of skills are most useful in carrying out everyday instructional activities? The ranking determined was as follows:

1. Educational Needs Assessment
2. Instructional Program
3. Behavioral Objectives
4. Behavioral Hierarchies
5. Evaluation of Instructional Systems
6. Systems Approach
7. Educational Taxonomies
8. Psychological Foundations

The ranking of the Educational Needs Assessment as having the most value, and the module on Instructional Programs as number two would seem to suggest that most teachers are vitally interested in humanizing their curricula by first determining the needs of their children and then by learning how to develop a program to meet these needs.

Furthermore, the results show the less abstract "how to do it modules" were better received than the more abstract and theoretical modules such as Systems Approach, Educational Taxonomies, and Psychological Foundations. This was true in spite of the fact that the staff

felt that one needs to understand the psychological and philosophical underpinnings of an instructional system in order to function more effectively as a teacher. The results seem to indicate that generally teachers will respond more favorably to inservice programs which are related to humanizing their program and techniques and which can be utilized as they are being learned.

SUMMARY

The purpose of Project IN-STEP was to develop a viable model for individualized, multi-media inservice teacher education programs. In order to accomplish the goal of the project, the program was ordered into three time segments known as Phases I, II, and III.

Phase I had as its goal to develop and field test the model. The criteria to be used in judging the success of the model were that it be: 1) effective, 2) economical, and 3) efficient. This segment was conducted during a 12-month period from July 1, 1968 to June 30, 1969. The curriculum which was to serve as the vehicle for development of the in-service training model was the contemporary elementary science education program Science - A Process Approach (AAAS Science).

A large number of teachers were pre-tested in the early fall of 1968 and placed in the various instructional groups as prescribed by the project. These teachers were then instructed by means of:

1. Video tapes
2. Self-study programmed text materials
3. Classes conducted by the IN-STEP instructors in which they actually used the AAAS classroom materials.

At the end of the academic year 1968-69 the approximately 300 public school and non-public school elementary teachers were post-tested and a random selection of their students was also post-tested along with a random selection of matched students of teachers from outside the program. The device used for the teacher pre- and post-test was developed by Dr. Rodney A. Lane of Florida Atlantic University and the IN-STEP staff.

Analysis of data received during Phase I testing suggested the

hypothesis that the "IN-STEP" approach is a successful method for conducting inservice training of teachers (at least in AAAS Science). This statement is based upon the following:

1. Gain in the mean scores of instructional groups II, III, and IV, generally at the .01 level of significance, presumably due to the instructional program.
2. The generally favorable attitude of the teachers who participated as reflected in the questionnaire.
3. The cost effectiveness comparison between training a hypothetical group of 300 teachers in AAAS Science with IN-STEP materials as compared with a traditional approach to training a like number of teachers.
4. Indirect measure of proficiency on one of the basic processes of AAAS Science of second grade students whose teachers had participated in the project. This test was indicated to be most likely not a valid test for any but the primary grades as the process tested for was that of observation which is presented in these grades and not in the upper elementary grades.
5. A moderately favorable indication of a difference in the attitude towards science in the attitude of sixth grade children (the only grade surveyed) whose teachers were trained in AAAS with the IN-STEP program compared to a random sampling of other sixth grade children in the county.[13]

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[13] Thurber, John C., "Evaluation Report, Phase I", op. cit., 1970.

The two operational objectives for Phase II were: 1) To revise instructional procedures and materials based upon feedback provided from Phase I. 2) To field test the revised instructional program by implementing it with additional groups of teachers.

Teachers in two Florida Counties (Palm Beach and Alachua) were pretested in the early fall of 1969 and placed into various instructional groups as prescribed by the project. A control group was tested in Palm Beach County during the spring of 1970.

In addition to the instructional methods utilized in Phase I, a publication written primarily by Karl Combs of the IN-STEP staff was developed and implemented. This text was known as the Action Handbook for Phases I and II.

At the end of the training sessions, approximately 236 elementary teachers in Palm Beach County and 275 in Alachua County were post-tested with the Elementary Science Teachers Inventory.

During the 1969-70 academic year, the operational objectives for Phase II were met and the field-testing portion of the evaluation added further credence to support the concept that the "IN-STEP approach" is a valid method for conducting of in-service education, based upon:

1. The gain in the mean scores of the fall instructional group, tested in Palm Beach County, on the Elementary Science Teachers Inventory. This was significant at the .01 level.
2. The gain in the mean scores of the instructional groups in Alachua County on the Elementary Science Teachers Inventory. This was significant at the .01 level.
3. The fact that of all the instructional groups tested in two years of operation only one did not obtain results statistically signi-

ficant at the .01 level and that one (Group III, 1968) obtained a reliability at the .02 level.

Although there was not an attempt to evaluate students in a formal manner in Phase II, extrapolation based upon student performance and attitude in Phase I, teacher's attitude measure in Phase I and direct questionings of those involved in Phase II points to a very meaningful consideration. Of the approximately 831 teachers (556 from Palm Beach County; 275 from Alachua County) trained with IN-STEP materials, 98% have modified their classroom behavior somewhat, and 69% have made more than nominal changes in their classroom behavior. It is at once apparent the real beneficiaries of these behavioral changes resulting from Phases I and II of Project IN-STEP were the more than 20,000 students in their classes.[14]

The rationale for Phase III was to see if the model could be successfully transferred to an area other than teaching teachers to teach elementary science. Successful completion of this transfer of the inservice education model should permit acceptance of the hypothesis that the "IN-STEP approach" is successful and proven method for conducting inservice education.

In addition to working towards this goal of model transference, the IN-STEP staff decided to develop the vehicle for field testing the model during Phase III. The vehicle was a course in Management of Instructional Systems. The IN-STEP model was then implemented to teach this course. During January through May of 1971, approximately 85 teachers in Palm Beach County took part in this facet of the program. Due to strenous efforts on the part of the staff, instruction in Phase III was individualized to a much greater extent. This was made possible by pre-assessing participants

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[14] Thurber, John C., "Evaluation Report, Phase II", op. cit., 1971.

before they engaged in the various sections (modules) of the course in Instructional Systems Management. The results obtained from field testing during Phase III show it to be a very successful effort. This premise can be based upon:

1. Approximately 93% of the participants in Phase III developed an instructional system of their own.
2. 100% of the participants completed at least one of the modules with a mastery of its content.
3. Approximately 98% of the teachers involved in Phase III indicated they had changed their behavior in the classroom and they would implement skills, materials, and new techniques which they had acquired.

The successful conclusion of all three phases of Project IN-STEP as follows:

Phase I - Development and field testing of an individualized multimedia model for in-service teacher education.

Phase II - Further refinement and field testing of the model.

Phase III - Successful transference of the model to another subject area,

has provided society with a way to offer inservice teacher education that is 1) effective, 2) economical, 3) efficient.

Furthermore, the development of a concise, sequenced course in the management and instructional systems was accomplished. As the implementation of the skills and knowledge gained in this course is based upon assessing the needs of the students, it is a vital step in teaching teachers one way in which they may humanize their curricula offerings, while still maintaining some structure within their program.